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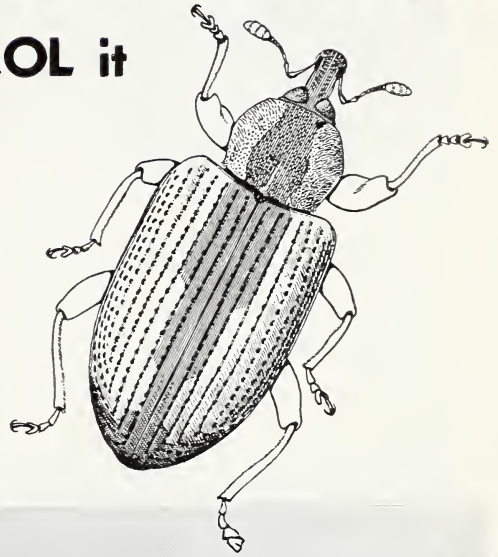
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# the Alfalfa Weevil

how to **CONTROL** it



Leaflet No. 368

U. S. DEPARTMENT OF AGRICULTURE



# THE ALFALFA WEEVIL

## How To Control It

Alfalfa is the Nation's most valuable hay crop.

Farmers grow more of it today than any other legume. They prefer it for livestock feed because of its high yield, its palatability, its richness in protein, and its high content of calcium and vitamins.

But on many farmlands the larvae, or young, of the alfalfa weevil<sup>1</sup> and the adults take the nutritional value out of alfalfa by feeding on the plant tips, leaves, and buds. They prevent the profitable production of seed. They reduce crop yields and cause millions of dollars of damage each year.

### NATURE OF DAMAGE

The larvae do the greatest damage to the first crop of alfalfa. They feed within the plant tips, on the upper leaves as they open, and then on the lower foliage, skeletonizing the leaves. Damaged leaves dry rapidly and the field takes on a grayish to whitish cast.

<sup>1</sup> *Hypera postica*.

After the first crop of alfalfa has been cut, the larvae crawl to the new shoots of the second crop and continue feeding. They retard new plant growth and may seriously damage the second crop. The adults also damage the new shoots.

### ORIGIN AND SPREAD

The alfalfa weevil was first found in the United States near Salt Lake City, Utah, in 1904. It has since spread throughout Utah and into Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Washington, and Wyoming. Between 1952 and 1957, new infestations were found in 11 Eastern States: Maryland, Delaware, Virginia, Pennsylvania, New Jersey, New York, West Virginia, North Carolina, Connecticut, Massachusetts, and South Carolina.

The weevils spread short distances by flying and crawling. Many are carried to haystacks during haying operations. They may move long distances in infested shipments of baled hay or other farm products.



## DEVELOPMENT

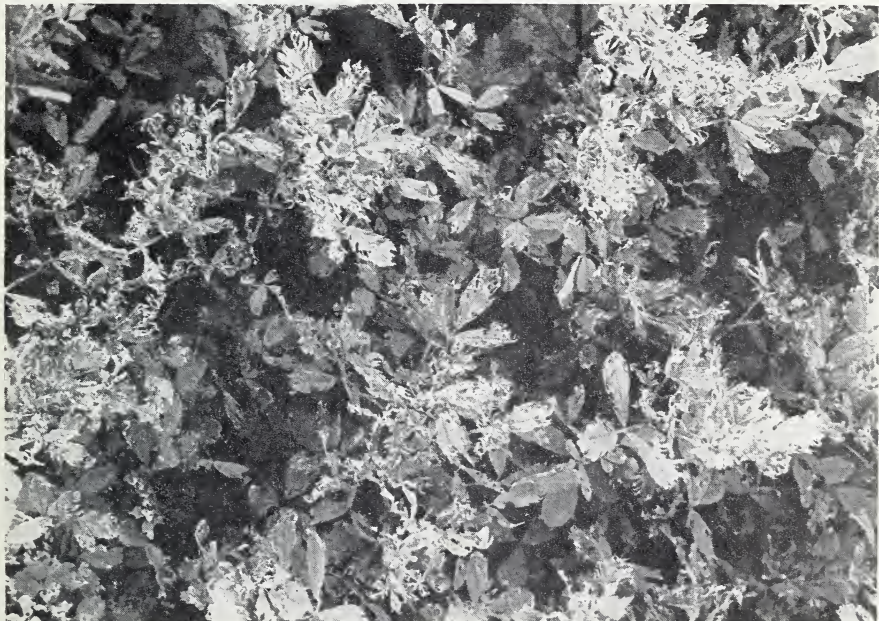
Alfalfa weevils pass through egg, larval, pupal, and adult stages in their development. In most areas, they produce only one generation during each growing season. But in California and in some of the Eastern States, they have a partial second generation. When cold weather comes, the adults crawl down into the crowns of the alfalfa or seek other sheltered places in alfalfa fields, nearby ditchbanks, or field borders, where they overwinter.

In early spring, the weevils become active. Each female lays several hundred eggs in clusters—2 to 25 eggs in each cluster. In the Western States the weevils first lay a considerable number of eggs inside dead hollow stems of alfalfa, grass, and

weeds lying on the ground. By the time the alfalfa is 6 inches tall, they have gradually shifted their egg laying to the growing stems. In the Eastern States the weevils lay almost all of their eggs in the green alfalfa.

The eggs are oval and about one-fiftieth inch long. They are lemon yellow when first laid and brownish when ready to hatch. In warm weather they hatch in 1 to 2 weeks; in cool weather they accumulate in the fields until temperatures favorable to hatching occur.

Larvae appear in April, and are numerous in the fields from early May to early June. The peak of abundance varies in different areas of infestation. The newly hatched larvae are about one-twentieth inch long and are yellow, except for a shining black head.



Alfalfa weevils chew up the plant tips, leaves, and buds of alfalfa plants. In so doing, they reduce crop yields and cause serious financial loss to growers.

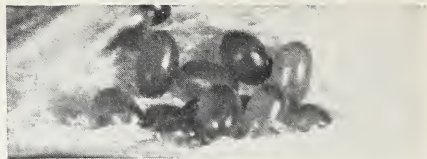
Larvae feed on alfalfa plants 3 to 4 weeks. During this time they molt, or shed their skins, 3 times. When full grown, they are about three-eighths inch long. Their heads are black; their bodies, green. They have a wide white stripe running down the middle of their backs paralleled by two faint white stripes on either side.

When they have finished feeding, the larvae spin cocoons about one-fourth inch long on the plants, or within the curl of fallen dead leaves, or in other litter on the ground. They pupate within the cocoons and change to adults. The adult weevils emerge in 1 to 2 weeks.

The adults are snout beetles and are about three-sixteenths inch long. At first they are brown, with a broad dark stripe extending down their backs from the front of their heads to more than half the length of their bodies. As the weevils age, many of them become uniformly dark brown or almost black.

Most of the old overwintering adults have died by the time the first crop has been harvested, although in the East some of them may survive to lay eggs in the second crop. The young adults are inactive during the summer, and remain in protected places near the alfalfa fields. They mate in the fall or in the following spring.

The females lay most of their eggs in the spring. However, they lay some eggs in the fall before cold weather sets in. In the lower valleys of western Colorado, and in the East, two-thirds to three-fourths of the females lay a considerable number of their eggs in the fall. Many of these eggs do not hatch until the following spring.



Eggs.

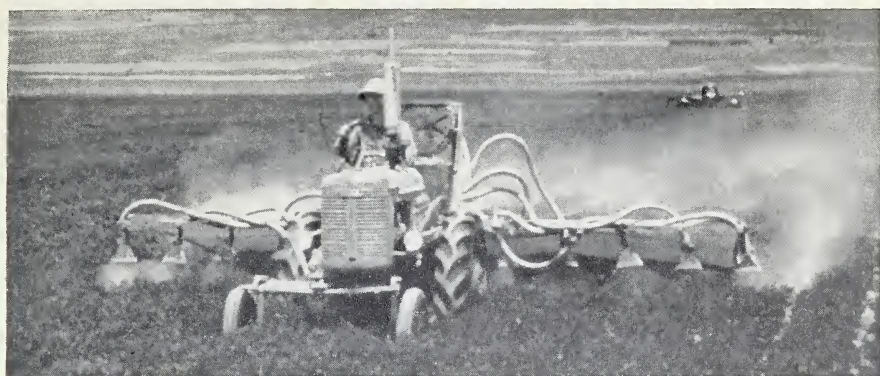


Larva.



Adult.





This farmer is dusting alfalfa in the bud stage for control of weevil larvae.

## CONTROL

Once alfalfa weevils infest a field, they usually cause damage season after season—unless they are controlled. Methods for controlling them consist of following recommended crop-management practices and using insecticides.

### Crop Management

In fields where alfalfa is grown exclusively for hay, weevil damage can be reduced (1) by growing dense vigorous stands and (2) by cutting the first crop when most of the plants are in the bud stage.

Cut plants clean and close. Remove hay from fields promptly. A field free of crop remnants deprives larvae of food and shelter and exposes them to the sun. The exposure is usually fatal.

### Insecticides . . . Western States

#### SPRING TREATMENT TO KILL ADULTS

You can best prevent alfalfa weevil damage by killing overwintered adults. Apply an insecticide to alfalfa (grown for hay or seed) in the

early spring when the plants are one-half inch to 2 inches high. Do not wait until the plants are higher. If you do, the females will have already laid a large number of eggs and the treatment will be of little value. Treat only once.

Apply dieldrin or heptachlor in a spray at the rate of 4 ounces per acre, or heptachlor in a dust at about 5 ounces per acre.

To prepare a spray that will give you the proper dosage per acre, mix with water—

**1½ pints of an emulsifiable concentrate containing 1½ pounds of dieldrin per gallon, or 1 pint of an emulsifiable concentrate containing 2 pounds of heptachlor per gallon.**

If you use a ground sprayer, you will need at least 6 gallons of spray per acre; if you make the application by airplane, you can use as little as 2 gallons per acre.

If you apply heptachlor as a dust, use 12 pounds of a readymade 2½-percent dust per acre.

#### SUMMER TREATMENT TO KILL LARVAE

If you are growing alfalfa for hay or for second-crop seed, and have

omitted or delayed the early spring treatment, apply one of the following insecticides in May or June to control the larvae. Treat as soon as the larvae are numerous on the first growth.

SPRAY OR DUST	DOSAGE PER ACRE
Methoxychlor.....	1½ pounds.
Parathion.....	4 ounces.
Aldrin.....	2 ounces.
Lindane.....	1 to 2 ounces.
Heptachlor.....	¾ ounce.

Prepare a spray with an emulsifiable concentrate of the insecticide by mixing it with water, according to directions on the container, to give you the proper dosage per acre. If you use a ground sprayer, you will need at least 6 gallons of spray per acre; if you make the application by airplane, you can use as little as 2 gallons per acre.

Or use a readymade dust according to directions on the container to give you the required dosage of the insecticide per acre. Dusts that are commonly used are 10-percent methoxychlor; 1-percent parathion, aldrin, or lindane; and 2½-percent heptachlor.

If you produce the first growth of alfalfa for seed, you will probably apply an insecticide to control lygus bugs. A spray or dust containing DDT or dieldrin, applied when the plants begin to bud, will control not only lygus bugs but also any alfalfa weevil larvae that may be present.

If you use a spray, apply DDT at the rate of 2 pounds per acre or dieldrin at 4 ounces per acre. Mix with 6 or more gallons of water—

4 quarts of a 25-percent DDT emulsifiable concentrate, or

1½ pints of dieldrin emulsifiable concentrate containing 1½ pounds of the insecticide per gallon.

This gives you an amount of spray sufficient for treating 1 acre.

If you use a dust, apply DDT at the rate of 3 pounds per acre or dieldrin at 4 ounces per acre. You can get these dosages by applying 30 pounds of a 10-percent DDT dust or 17 pounds of a 1½-percent dieldrin dust per acre.

### Insecticides . . . Eastern States

For best control, destroy the weevil larvae by spraying the alfalfa during the last half of April when the plants are 10 to 15 inches tall and most of the growing tips are beginning to show damage. Apply heptachlor at the rate of 4 ounces per acre. This treatment should protect the first crop for a few weeks or until it is harvested. If a heavy reinfestation occurs not later than 2 weeks before harvest, make a second application of heptachlor at the same rate.



A weevil parasite, above, kills 80 to 90 percent of the early-season larvae in the Western States.



If large numbers of larvae and newly emerged adults are present when the first crop is harvested, apply heptachlor at the rate of 4 ounces per acre in a spray: apply it to the alfalfa stubble as soon as the crop is removed.

Prepare the heptachlor spray with an emulsifiable concentrate of the insecticide as described under "Spring Treatment To Kill Adults" (Western States). Apply at least 10 gallons of spray per acre with a ground sprayer.

## WEEVIL PARASITE

In parts of the Western States, a small black wasp, commonly called

the weevil parasite,<sup>2</sup> often kills 80 to 90 percent of the larvae that appear at the beginning of the season. The weevil parasite lays its egg in the weevil larva; the parasite larva hatching from the egg feeds inside the host. A parasitized weevil larva dies soon after it spins its cocoon. The parasite larva then constructs a brown white-banded cocoon of its own.

After the first crop buds, parasitism declines and is negligible during the second crop.

The parasite has been introduced into several of the infested Eastern States. It is too early to know whether it will become established and aid in control of the weevil.

## PRECAUTIONS

Most insecticides are poisons. Handle insecticides with care. Follow the directions and heed all precautions on the container label.

In handling or mixing concentrated insecticides avoid spilling them on your skin and keep them out of your eyes, nose, and mouth. If accidentally spilled on the skin or clothing, wash off and change clothing immediately. Wear a respirator if you are working in high concentrations of sprays or dusts during loading or mixing operations.

In applying dusts or diluted sprays, avoid getting them on the skin and keep them away from your eyes, nose, and mouth. Avoid repeated exposure. After using insecticides, bathe thoroughly and change to clean clothing.

Parathion is particularly dangerous and may be absorbed through the skin, eyes, lungs, or mouth. Persons handling it should wear a gas mask

or respirator equipped with a canister of a type recommended by the U. S. Department of Agriculture.

Parathion should be applied with power machines only and by persons experienced in handling poisonous chemicals.

If you accidentally swallow an insecticide, induce vomiting by taking 1 tablespoonful of salt in a glass of warm water. Repeat if necessary. Call a doctor.

Store insecticides in a dry place where children and animals cannot reach them. Be sure that they are clearly labeled.

Do not feed alfalfa treated with aldrin, dieldrin, DDT, or lindane to dairy animals, animals being finished for slaughter, or to poultry. Do not use these insecticides on forage to be sold commercially or to be shipped interstate.

<sup>2</sup> *Bathyplicies curculionis*.

If you apply one of the following insecticides for alfalfa weevil control, wait the periods indicated before allowing animals to feed on the treated alfalfa:


Parathion—15 days.

Methoxychlor—7 days.

Heptachlor— $\frac{3}{4}$  oz. per acre—3 days.

4 oz. per acre—7 days.

5 oz. per acre—10 days.



## *Fight Your Insect Enemies*

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Washington, D. C.

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